

Magazine
NOVEMBER 1960

By Mark Abrams



The I.C.I. Magazine, price twopence, is published for the interest of all who work in I.C.I., and its contents are contributed largely by people in I.C.I. Edited by Sir Richard Keane, Bt., and printed at The Kynoch Press, Birmingham, it is published every month by Imperial Chemical Industries Limited, Imperial Chemical House, Millbank, London, S.W.1 (Phone: VICToria 4444). The editor is glad to consider articles and photographs for publication, and payment will be made for those accepted.

VOLUME 38 NUMBER 287

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Contributors



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Douglas Middleton is in charge of the ICI Game Research Station at Fordingbridge in Hampshire. He joined the Company in 1937 after five years' ecological research on gamebirds in the Oxford Bureau of Animal Population. During the war he was seconded to the Agricultural Research Council for research on farm pest control. Has recently taken an active part in the formation of the new Game Research Association, to which he is Honorary Research Adviser. Other interests include shooting and cooking—preferably gamebirds.

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FRONT COVER: Traction Engine Rally, Chester-le-Street, Co. Durham, by W. C. Cobb, Wilton Castle
(Taken with Ensign Selfix 16/20 model camera, Agfacolor CT18, daylight reversal, 1/100 sec. at f/8)



ACH week the average British family spends approximately £10 buying goods and services from retailers of all kinds. About three-quarters of this is passed back by the retailer to the manufacturers and wholesalers from whom he has bought his stock, and the remaining quarter is kept to cover the retailer's costs (rent, wages, lighting, etc.) and his profits. Some critics complain that this margin is too big and urge the retailer to become more efficient. In defence the retailer argues, correctly enough, that part of the apparent inefficiency is largely due to the peculiar shopping habits of the general public.

More particularly, he points to the fact that roughly half his trade has to be handled on Fridays and Saturdays; on the other four days of the week his shop, although fully equipped and fully staffed, is dealing with only a comparative trickle of trade. Because of this unevenness of the week's business the cost of running a shop is higher than it would be if the same amount of trade were handled every day of the week.

This state of affairs goes back a great many years and is to be found

throughout Europe. There was therefore a great deal of interest when nearly two years ago a well-known chain of retail shops in Switzerland, Migros, set out to do something about it. Cash bonuses were offered to customers who could show by their sales checks that they had made purchases on the slackest day of the week. With this carrot dangled before them it was hoped that a fair number of people would go after the prizes by shopping at the beginning of the week.

The first figures have now been published, and at a first glance they seem very encouraging. In the three months before the scheme was launched

the shops concerned handled slightly under 51% of their week's trade in the first four days of the week; twelve months later this proportion had risen to slightly over 55%. As a result of this more orderly flow of trade, operating costs did in fact fall. So far, so good; but the cash bonuses handed out during the first fifteen months of the scheme amounted to £300,000, or roughly double the saving in operating costs. In the final reckoning, therefore, the retailer's total costs were up. From the accountant's point of view,

From this experiment I think one is led to a much neglected truth about all attempts to change people's behaviour. Wherever one finds persistent economic habits and institutions it is highly likely that they persist because they serve a useful purpose.

This does not mean that such habits and institutions are either perfect or desirable. But it does suggest that whenever a reformer comes across something he wants to change he should start by asking what human needs have been satisfied by keeping the habit or institution alive. When he has the full answer to that question there is always the risk that the would-be reformer will become a defeatist and decide to accept things as they are. But what is more likely is that, with his new understanding, he will become a much more successful and efficient reformer.

The opinions expressed in this article are not necessarily those of the Company

Science Aids the Gamekeeper



By Douglas Middleton

Quietly at Fordingbridge in Hampshire a revolution in the techniques of rearing and preserving pheasants and partridges has taken place. ICI has changed all this from a subtle, costly art understood by only a few into a routine that anyone can carry on in his own back garden—and, if he so wishes, dispose of the crop at a profit to others

Drawings by Alex Jardine

THE manufacture of shotgun cartridges by Metals Division is one of the oldest activities of the Company. Output is divided roughly 50-50 between home and export. The level of activity on the shop floor of the Kynoch cartridge factory is therefore directly connected with the amount of shooting done in Britain. The more plentiful the game, the more cartridges will be loosed off. ICI has thus an obvious and open self-interest in devoting a small fraction of its scientific resources to the study of how best to help the gamekeeper, the sporting farmer and the big landowner to produce more game. It is just plain business common sense.

Of course, others who have not contributed to the cost of this research have shared in the benefits. The activity of preserving game for shooting plays a sizeable part in the general economy of the country. £300,000 was collected last year by the Exchequer from gun and game licences. British gunmakers are world famous and export over 50% of their production. Landowners derive a substantial revenue from letting, and more people are employed on the land. In fact, in many countries, notably in America and Scandinavia, game is regarded as such an important annual crop that state-aided organisations, with funds derived from game licence revenue, exist to conserve game and carry out research to improve its husbandry.

The need for work of this kind in Britain was recognised by ICI as far back as 1933, when the Company started a research project to find out more about the factors influencing stocks of game and the ways of preventing their decline. After the war this work was centralised and expanded into the ICI Game Research Station at Fordingbridge in Hampshire.

In 1946 ICI, in addition to building simple research laboratories at Burgate Manor, Fordingbridge, rented the shooting on about 4000 acres of farmland nearby. Here the scientific and practical problems of game production and management were studied in detail. At the same time a nation-wide advisory service was established to help landowners, farmers and gamekeepers and to study the problem of game conservation and management under the very variable conditions which Britain offers. This service really worked in two ways. ICI gave advice, but at the same time our research effort was greatly aided by this close personal contact with problems on the spot.

In practice the job proved far from simple. It involved investigating factors such as disease, control of vermin, the foods, habits and living conditions of the birds themselves, and the relationship of effective game management to good farming, forestry and the other competitive uses of land in crowded Britain.

Briefly, the problem was tackled from two angles. First, there was research aimed at building up practical methods of literally making two gamebirds live where only one or none lived before. Secondly, there was our effort to show the owners of land how to use these methods and how to produce for themselves the desired result.

Work of this kind is inevitably slow, one reason being that gamebirds breed only once a year. But the team at Fordingbridge can now claim to have made a great deal of progress, so much so that pheasant rearing and feeding in penned conditions (important for augmenting wild stock) have changed from a subtle art only understood by professional keepers into a routine which can be applied by anyone from a farmer's daughter to a city commuter.

I will give you a few examples. In the old days pheasants, reared exclusively on the big keepered estates, were always hatched by broody hens and reared by these foster-mothers with hundreds of coops spread over many acres of grassland and one or more

keepers constantly in attendance. Losses from predators, weather and other hazards were often enormous, and the whole job was too expensive for any but the big landowners. Hence the old saying: "Up gets a guinea, bang goes three-halfpence and down comes half a crown."

Nowadays the new methods of rearing in movable pens with the same old broody foster-mothers have halved the labour on the rearing fields and quartered the space needed for the same number of pheasants. So the keeper can protect his wild nests at the same time as rearing.

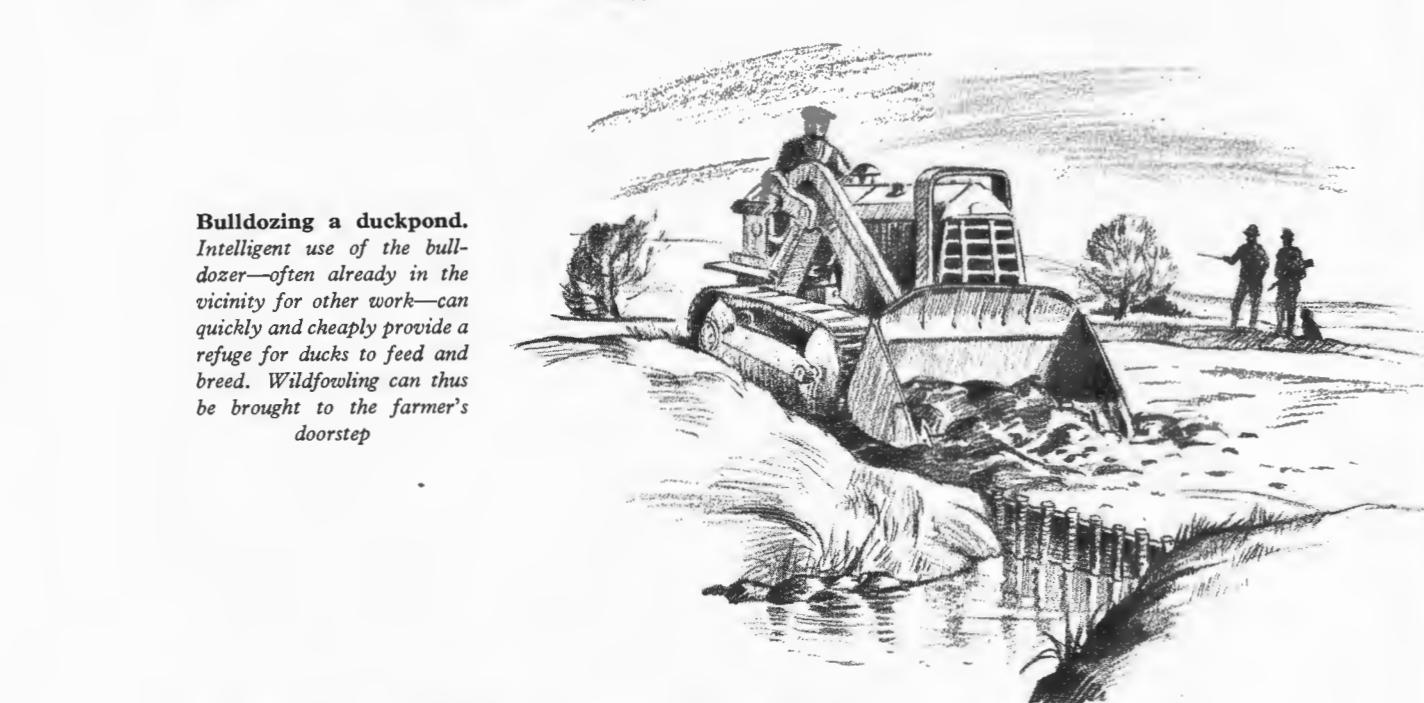
Another method of pheasant rearing, which is even more economical, takes less time and requires less training, is the artificial incubation of pheasant eggs and the rearing of the young chicks in electric brooders in batches of a hundred or more, compared with the fifteen or sixteen dealt with by a broody hen. Until about ten years ago the food for rearing pheasants was a most elaborate concoction—varying with every keeper—of boiled eggs, stewed rabbits, meat, specially



When birds die from disease or poison, it is important to find the cause. A dead bird is here brought to a laboratory for examination. (LEFT) A partridge marked with a specially designed ICI tab. These tabs can be read through binoculars, and thus a record be kept of the movements of individual partridges in their natural state



Planning farm rotation of crops so that game will have food and cover within easy range is important for the game-minded farmer. ICI's Advisory Service helps with this



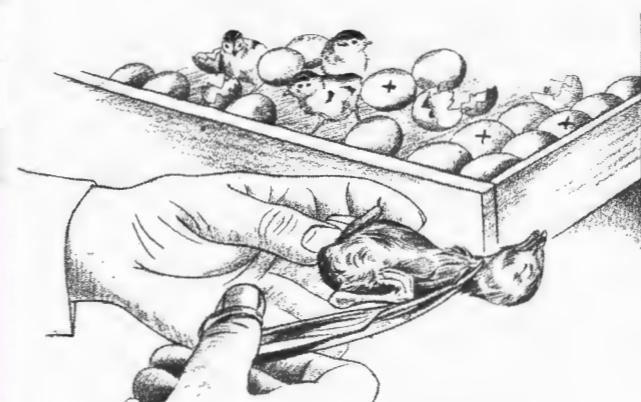
Bulldozing a duckpond. Intelligent use of the bulldozer—often already in the vicinity for other work—can quickly and cheaply provide a refuge for ducks to feed and breed. Wildfowling can thus be brought to the farmer's doorstep



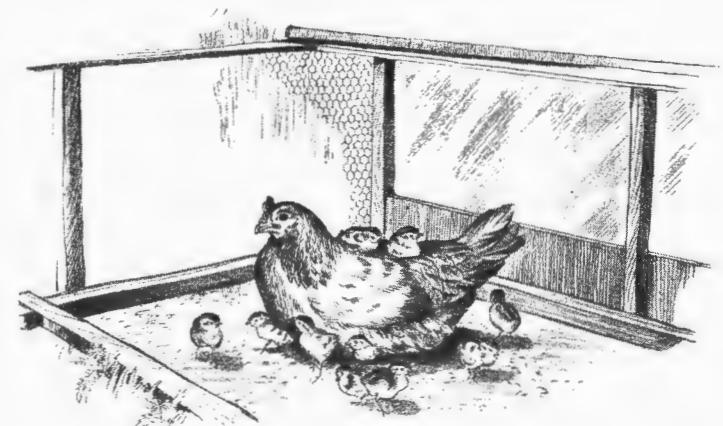
Rearing pheasants in movable pens with broody hens as foster-mothers is one of the main jobs of gamekeepers. ICI advisers are available for regular visits to discuss problems and help all they can



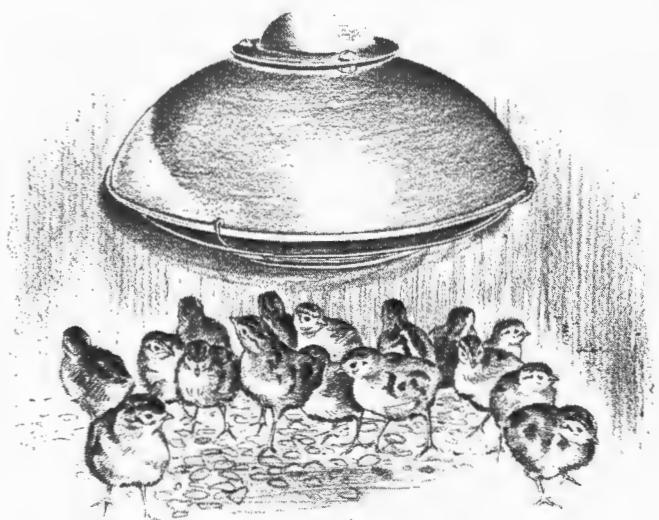
Artificial tunnels sited along hedges and ditches and containing a trap are a recognised method of reducing predators like stoats and rats. They use these tunnels for cover and then get caught in a trap. These instant-killer traps, one of which is here being tried out, now replace the outlawed gin trap



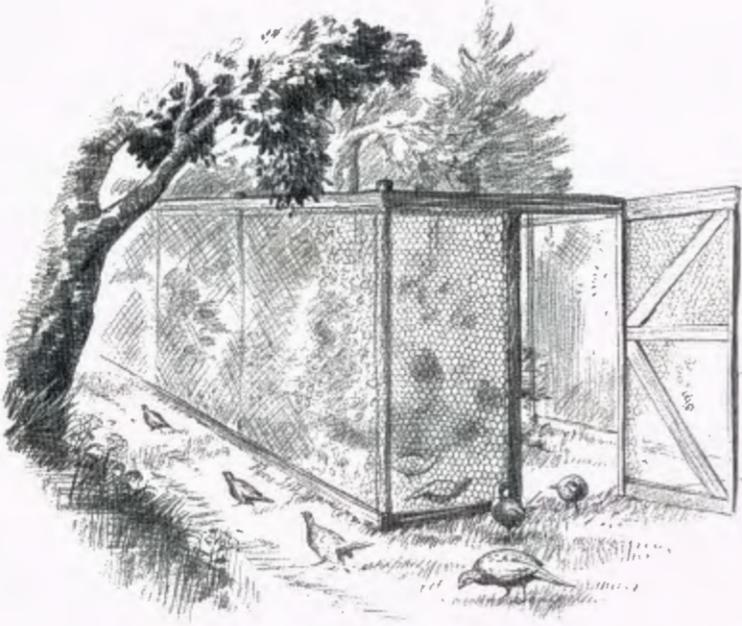
Partridge chicks with a Bantam foster-mother inside a movable pen. The ICI-developed movable pen has now largely superseded the old method of giving the chicks free range. Movable pens offer better protection and need less labour. One of the problems successfully solved by ICI research was to formulate a balanced ration for chicks in confinement



Incubation of pheasant and partridge eggs is a new development pioneered by ICI in the last ten years. These are more difficult to incubate than hen eggs: temperature, humidity, and degree of air movement have to be more strictly controlled and vary at different stages of incubation. Seventy per cent hatching has now been achieved, but the target of the research worker is much higher. A chick that failed to hatch is here being examined



After hatching, game chicks can now be satisfactorily reared with artificial heating, such as overhead infra-red, replacing the traditional foster-mother. This is one of the most useful advances achieved by ICI at Fordingbridge. A lot of research into practical difficulties was needed before the know-how of a reliable routine was evolved



After rearing in brooders, pheasants have to be introduced slowly to wild life. To do this they are put into large pens in the woods. Here they spend two or three weeks and are gradually released in batches. This gradual release is the key to the problem of preventing the birds from straying too far

prepared biscuit meal, spices, and even a bottle of port wine to tickle the baby chick's palate. All very expensive and not always very good for its purpose. Research and practical rearing trials have now produced simple "crumbed" foods perfectly balanced with all the proteins, vitamins, minerals and what not to grow perfect pheasants. What is more, the pheasant chicks like them and eat them and do grow into perfect pheasants. And, still more important, the new foods are vastly cheaper than the old mixtures. In fact, it is true to say that, using these methods, the old adage should be revised to: "Up gets half a guinea, bang goes sixpence, and down come three half-crowns."

More Reared Pheasants

As a direct result of all this, pheasant rearing, as measured over a million-acre sample, increased by 44% in the last four years. New methods, too, are producing similar results with partridges. For example, in the old days only a few experienced keepers ever attempted to rear partridges, with specially selected bantam foster-mothers and ants' eggs for food. Now they can be dealt with almost as easily as pheasants—with incubators, brooders and balanced crumbs. There is still a lot to learn about partridges, but anyone sensible who studies and applies our methods can quickly build up a stock of

game which formerly would have meant years of conservation before there was a shootable surplus.

So far I have talked chiefly about progress in artificial rearing. But the fact is that the basis of most good shooting will always be the careful preservation of adequate stocks of wild game. Here again the work done at Fordingbridge has provided new knowledge of conditions required for good game production. It has enabled us to know what cover, food and protection from natural losses are needed, as well as when, where and how to apply this knowledge with the greatest economy in cost and labour. It is, in fact, now becoming possible to advise any occupier of land in almost any part of the country on the steps he should take to foster a shootable stock of game. For instance, winter feeding helps to hold a stock of wild game, so Fordingbridge has developed a simple feeding hopper which anyone can make for practically nothing out of discarded oil drums. New traps and methods of trapping ground and feathered vermin have done much to reduce the natural losses of game. Special seed mixtures for sowing in rough corners provide ideal cover and food for game.

Shooting gains Popularity

Shooting has always been a most popular sport among farmers, countrymen and country lovers forced to earn their daily bread in the towns. There is no shortage of fertile ground for the Fordingbridge seed. Indeed, one of the features which has contributed greatly to the success of this work is the enthusiasm of the shooting public and their ready co-operation in applying the knowledge made available for them.

Actually this enthusiasm can be rather embarrassing to the staff at Fordingbridge, so much so that visitors anxious to learn on the spot, and not content with booklets, films and advisory visits, have had to be severely restricted. The potential for increase of game under careful management is also enormous, in spite of the unfavourable conditions created by some modern farming methods and the spread of urbanisation. Fordingbridge has every reason to judge that the country as a whole could easily carry three or four times its present density of game. So there is plenty of scope.

Expansion of this service to meet the full public demand in a short time, however, costs a lot of money, and the Company must set a limit to the expenditure considered justified by ammunition sales. This year a milestone was reached in the progress of Fordingbridge

in that the lease of the experimental shoot ran out, so the project had to be considerably reorganised. In future, the greater part of our effort will be concentrated on an increased advisory and educational service beamed at putting into practice the knowledge so far gained. Research will continue on the most important problems, but it is beyond our resources to maintain a research team which can cope with *all* the lines of enquiry.

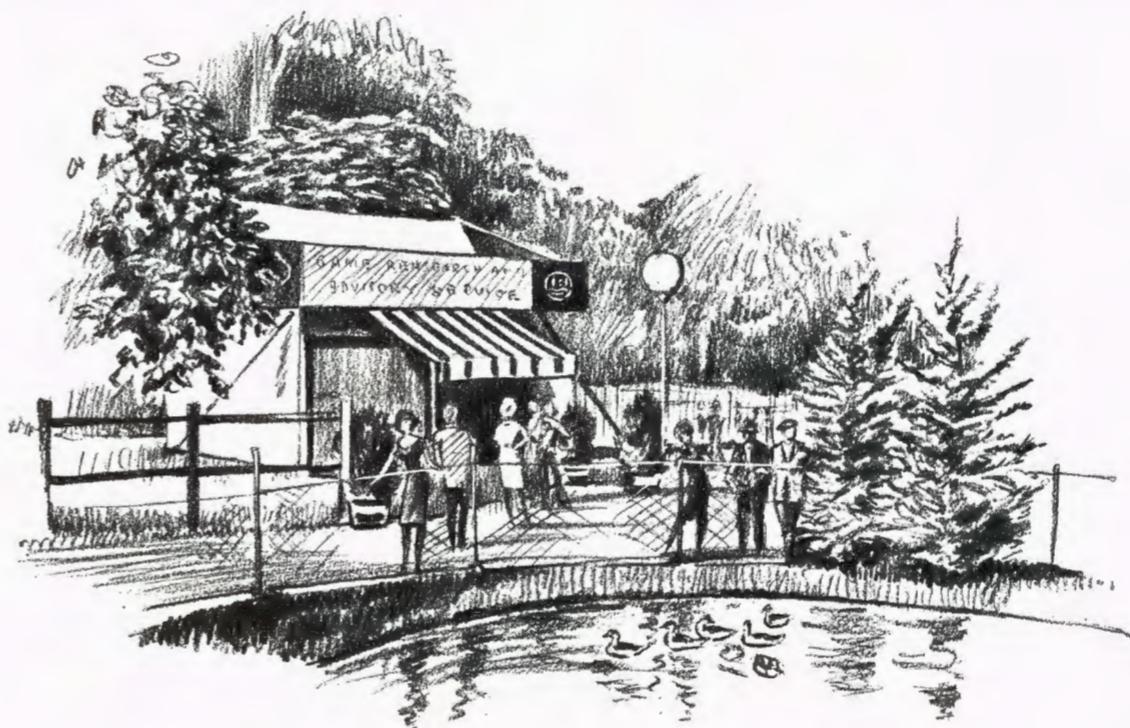
Fortunately, at this milestone, many landowners, farmers and others concerned with game have realised the importance of expanding the research effort. A responsible group, headed by no less a sportsman than our Prime Minister, has undertaken to form a Game Research Association. This Association will be supported by voluntary donations from landowners, farmers and industry together, and its funds will be devoted entirely to a long-term programme of research. Naturally ICI welcomes this sharing of the burden, and the Company will collaborate in every possible way with the new Association. It may be significant that the Government, too, is at last recognising the importance of game by supporting, through the Nature Conservancy, a research project on grouse—a field which ICI has unavoidably neglected so far.

As part of its contribution to future research ICI is

providing at Fordingbridge laboratory accommodation and facilities for the scientific staff of the new Association with whom ICI research men will continue to work, and the fruits of the experience and contacts already accumulated by ICI will be pooled.

What is the target of these research workers? There is a big field: I can only enumerate here a few of the problems on which more light is needed.

We need to know more about the pattern of the farm crop, hedgerow and woodland environment which can be encouraged to give the best natural conditions for holding wild game. Why does not Somerset or Devon produce as many partridges as Norfolk or Lincolnshire? What are the best methods of release—pens, age, place, time, foods, etc.—for artificially reared birds to ensure their best survival and acclimatisation as future breeding stock? A lot more detailed research is also needed on the various diseases, such as "gapes," which sometimes cause heavy losses. And on apparently simple things like saving birds and their nests from being cut to pieces by grass-cutters, or how best to preserve the vital nesting cover for game while still making full use of every inch of land for farming. It is the complex of all these factors that determines the size of the shootable crop of game or whether there will be any crop at all.



The ICI centre at the Game Fair, an annual sporting event now in its fourth year. With attendance increasing year by year, the Game Fair provides a valuable opportunity of demonstrating ICI's methods of improved game production

NEWS IN PICTURES

Home and Overseas



Ringside seat. CIL directors, who include four members of the ICI main board, recently paid a visit to CIL's explosives plant on James Island. Above: watched by the small sons of CIL Supervisor Graham Parker before they board the plane are (*l-r*) Mr. R. C. Todhunter (an ICI overseas director), Mr. P. C. Allan (president of CIL and ICI non-executive director), Mr. W. D. Scott (ICI commercial director), Mr. E. A. Bingen (an ICI deputy chairman), with Mr. G. B. Gordon, Mr. W. T. D. Ross, Dr. H. G. Reid and Mr. B. I. McGreevy



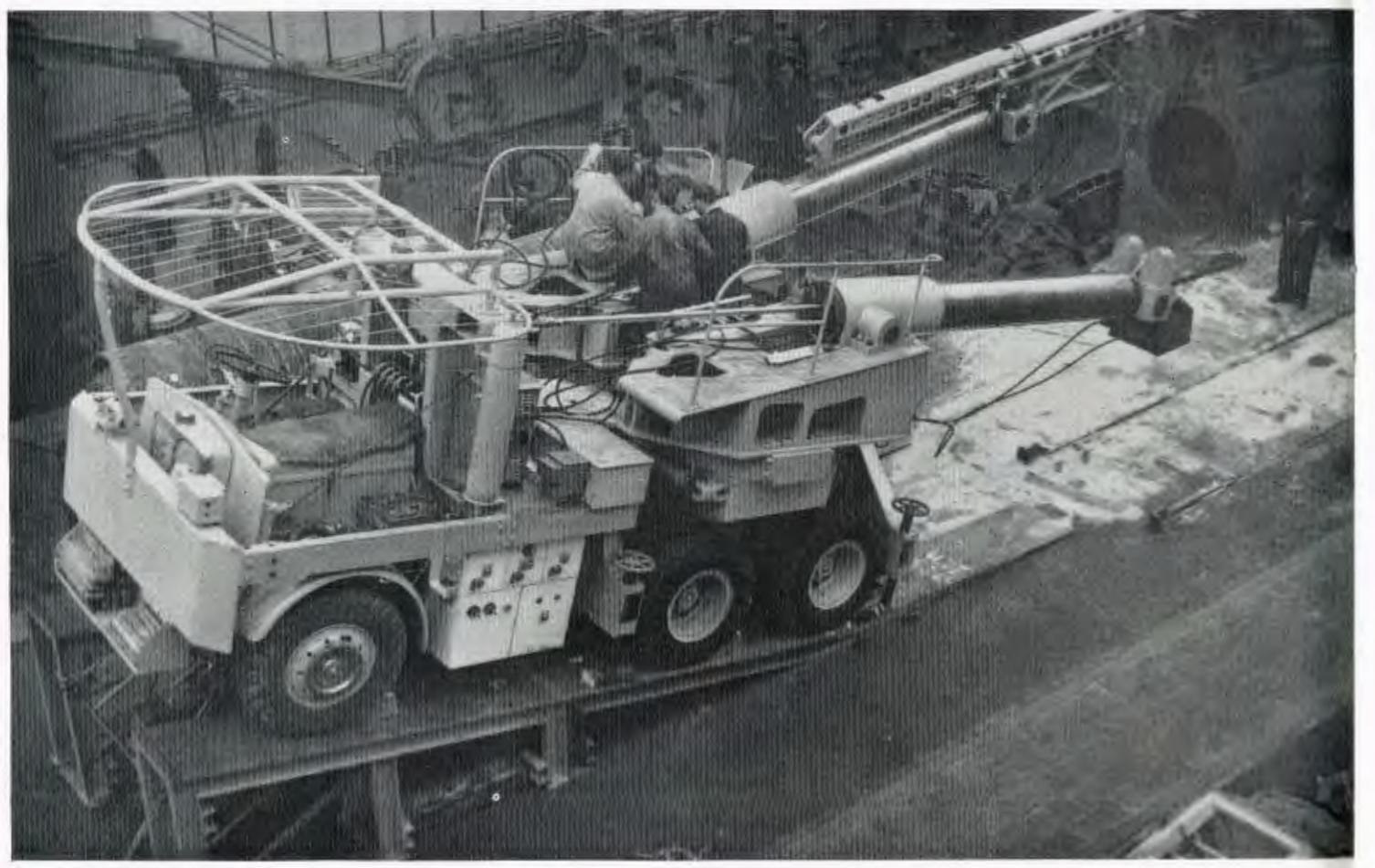
Bronze medallists. Out of 5000 entrants for recent Royal Society of Arts examinations, four of the twenty bronze medals awarded went to Billingham Division girls. They are (*from the left*) Miss Betty Allan, Miss Margaret Sturdy, Miss Sandra Wright and Miss Sylvia Smith. This is the first time that as many as four medals have come to Billingham at one time



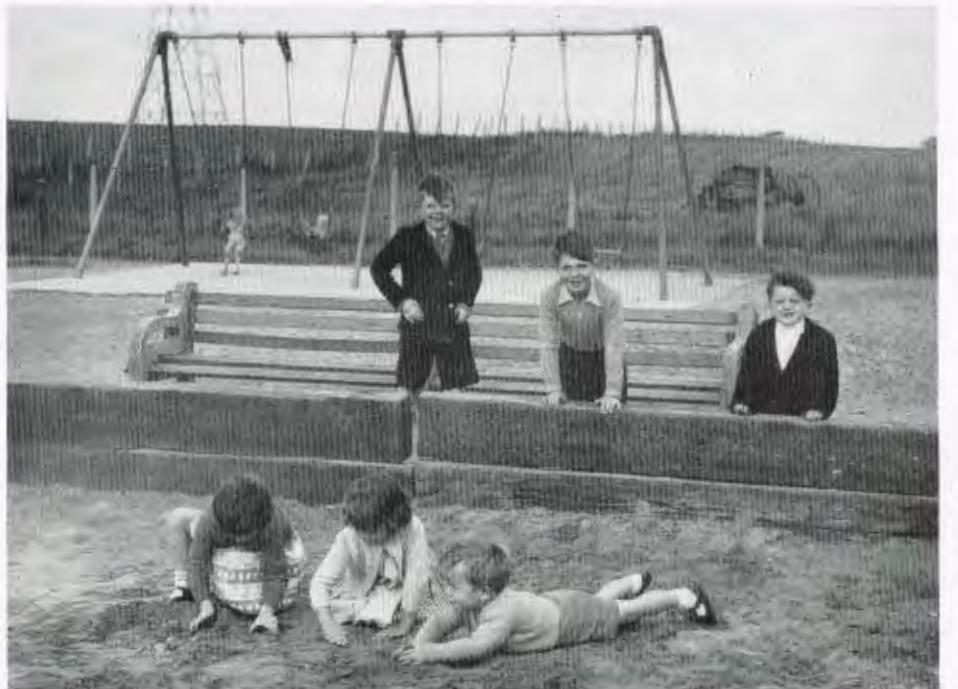
Double diamond. Two Metals Division pensioners recently celebrated their diamond weddings. *Left:* Mr. Arthur Bolton and his wife. Mr. Bolton first retired in 1939, but returned during the war and retired finally in 1946, having completed 44 years' service. *Right:* Mr. and Mrs. Edwin Southwick. Mr. Southwick retired in 1943 after 43 years' service



Fire fighters from Plastics Division's Billingham Works competed in the national finals of the Industrial Fire Protection Association's Fire Brigade competition on 17th September. Here the team, Tommy Hornby, Frank Barnett, Joe Griffiths and Len Mitchell, with Harry Smith as reserve, carry out an exercise. A tough fight placed them tenth out of the twenty-four best industrial fire-fighting teams in the country



Workshops meet the challenge. This giant drill has been made in the Billingham Division workshops. It has been specially designed for use in the anhydrite mine and the work of nine different workshops met the challenge of ensuring that all components and sub-sections were ready for assembly when needed



The children of Weston Village can now play safely off the roads in their own playground, presented to them by General Chemicals Division. Asked by Runcorn Urban District Council to give land for this purpose, the Division agreed to do this and also paid for the equipment



Really tough was how Mr. E. Holmes of Billingham Division described a gruelling ten-mile race up and down Ben Nevis, in which he finished 17th out of 102 runners



'Terylene' with tuxedos. 'Terylene'/cotton evening shirts by Rocola are seen here being tried out by Harry Roy and his double bass player while playing at the Candlelight Room of the May Fair Hotel. The shirts will be on sale by Christmas.

Price approx. 72s. 6d.



Mr. Bert Robson (Billingham Division) was an official timekeeper for the Amateur Swimming Association's national championships at Blackpool, where competitors included most of the team which represented Britain at the Rome Olympics



Their bomb. An unexploded bomb, thought to have fallen during the war on a waste tip at General Chemicals' Pilking-ton-Sullivan Works, is interfering with plans to use some of the waste material. Excavations have been held up while the Bomb Disposal Unit investigates



1000th member. Watched by two works councillors and Mr. A. F. Woolner, assistant works manager (*extreme right*), Miss E. Marshall, labour records clerk, "signs in" Mr. Leslie Nixon as the 1000th man on Wilton's Plastics Works payroll. After his welcome, he was handed a mother-of-pearl 'Perspex' tray—an appropriate gift for a future 'Perspex' plant man

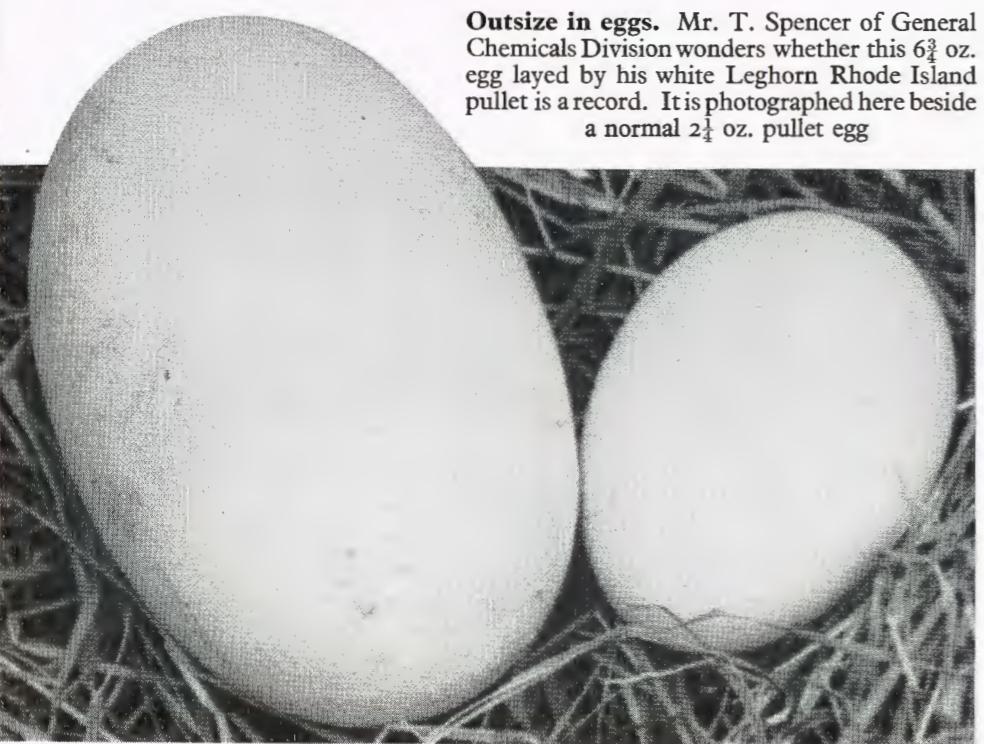
Cairngorm adventure. Four girls from Nobel Division took part in a special leadership course, sponsored by the Scottish Industrial Sports Association, at Glenmore Lodge in the Cairngorms. Here (l-r) Margaret Craig, Anne Cowan, Eleanor McAleese and Sheena Cox carry their canoes up the beach. The course lasted one week and included dinghy sailing, rock climbing and hill walking



'Dulux' deliveries. Compactly conveying 'Dulux' paint, this jaunty Lambretta van plies its way between the warehouse of our Nigerian agents, United African Company (Technical) Ltd., and their customers in Lagos. It not only delivers the paint but advertises it as well



Outsize in eggs. Mr. T. Spencer of General Chemicals Division wonders whether this $6\frac{3}{4}$ oz. egg laid by his white Leghorn Rhode Island pullet is a record. It is photographed here beside a normal $2\frac{1}{2}$ oz. pullet egg



Silver medallist. Mr. Jim Horan, a member of the Billingham Synthonia small bore rifle section, recently won a silver medal in the B class shoot at the Scottish national championships. Later he was chosen as first reserve for the English international team. Unfortunately for him, none of the team had to call off



Flashback to 1929. The 50th meeting of Central Council takes place at Blackpool this month. Our picture flashbacks show how it all started. Above: Lord Melchett (standing), ICI's first Chairman, speaks to Sir Harry McGowan just before he opens the inaugural meeting of Works Councils held in the refectory of the newly completed Imperial Chemical House in April 1929

Marine Hotel TROON Ayrshire	
<i>Imperial Chemicals Industries Limited Works Council April 1929</i>	
Colours	
Leasing	£164. 9. 4.
Repairs	13. 11. 7.
Provisions	16. 0. 0.
Borne Hotel	214. 2. 11.
Imperial Hotel	65. 18. 1.
Post Office	353.
Victoria	217. 12. 6.
" Supper	149. 0.
Cashews	66. 11. 6.
Brassards	259. 7. 6.
Snacks & Fridge	5. 6. 0.
With Expenses for Travel	11. 10. 0.
Supper Ladies	15. 8. 6.
Leave Days &c for Workmen	55. 09. 0.
Total	£1229. 59. 1.

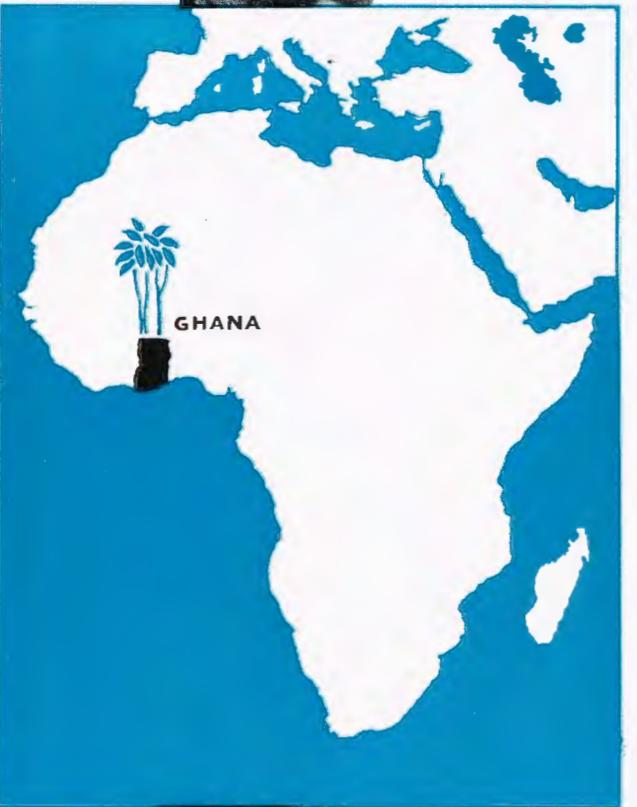


Leaving Euston. Special coaches met the representatives to bring them to the inaugural meeting at Millbank



The bill. A note of expenses incurred for that first meeting. It is in the handwriting of Mr. Richard Lloyd Roberts, ICI's first Chief Labour Officer

ICI Bravery awards. The first men to gain bravery awards received them from ICI President Sir Harry McGowan (third from left), at the third Central Council meeting held in November 1930



Cocoa

By Francis Baranyovits

The golden—and surprising—story, of how a slender tropical tree yields the fruit which becomes the chocolate of the Western world

Photographs by the author

I WAS deeply impressed when I first entered a cocoa* plantation. I was in tropical forest, beneath the protective shade of forest trees 200 ft. tall; and here below them grew the slender cocoa tree scarcely reaching to 30 ft. They were closely planted—400–600 to the acre—and their thin, bushy branches formed a complete canopy overhead. Standing there beneath them, I was enveloped in a soft, greenish light, dark in contrast to the bright sunshine outside. In this restful gloom the golden yellow of the ripe cocoa pods hit one like a spotlight.

My first impression was that the cocoa pods, hanging nakedly from the tree trunk, looked rather like small cantaloupe melons. What a comfortable crop to harvest, I thought, for some of them were within a few inches of the ground. There are always some cocoa trees in bearing, so that ripe fruit, immature buds and flowers occur together at the same time. Nevertheless there are two main cropping periods—June to July and November to December.

The flowering of the cocoa tree is one of the most surprising things about it. The blooms appear not among the leaves, but on slight protuberances on the bare stem. Called, appropriately enough, "cushions," they bear delicate attractive flowers lasting only a short time—so short unfortunately that only about 5% of the flowers are pollinated. And there is further loss in the dropping of young fruits when they are about an inch long.

The pods take about six months to ripen. At the end of that time, each ripe fruit contains 20–40 seeds (called beans) within a hard outer crust 6–10 in. long and about 4 in. in diameter. This outside coating is furrowed from end to end.

The pods are harvested by hand and collected to a centre, and the beans are removed from their shell. Then comes the secret of cocoa production—fermentation. One is reminded of the fermentation of barley to make malt.

The seeds when removed from the husk are still embedded in a white mucilage, which being sugary provides

the basis of the fermentation. It is this fermentation which transforms the cocoa bean from a fruit so bitter as to be unpalatable into the delicious food which we all know either as cocoa or, when sweetened, as chocolate.

The technique of fermentation is quite simple. The sticky mess of seeds is put into boxes or baskets, or even simply piled in a heap on banana leaves, and kept covered with further fronds to retain the moisture and high temperature. Fermentation takes about six days, and invisibly during this period vital chemical changes take place. The heaps have to be turned every second day to ensure that the process is even. At the end of this time the mucilage has turned into a vinegary liquid and seeped away, leaving the bean brown and clean.

The beans are then ready for drying, which is again a process requiring considerable skill. Chemical changes are still taking place within the bean, and drying carried out too rapidly would result in loss of quality. Drying can be done artificially, but most growers dry the beans in the sun, spreading them out on slatted benches where they remain until perfectly dry, with a moisture content of less than 8%. The beans are then ready for sacking and sending to market.

Chocolate manufacturers are most careful in their selection of beans on the market, because they know that no magic of theirs can improve badly fermented, inadequately dried or ill-stored beans.

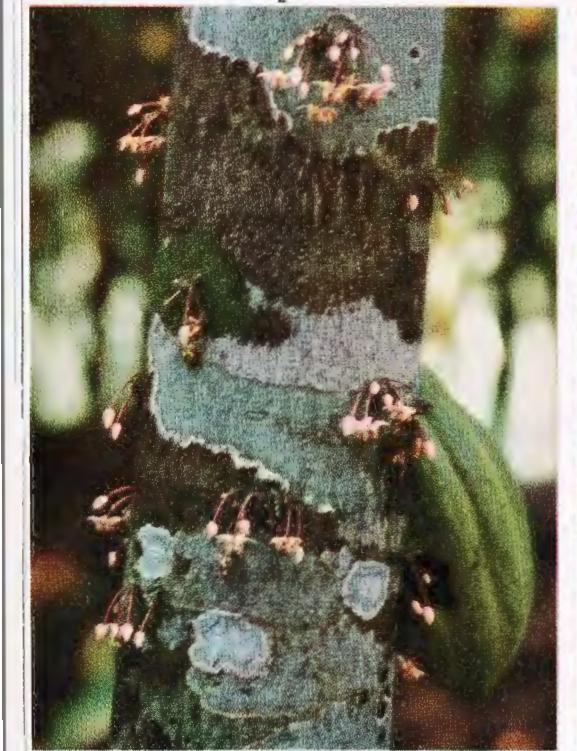


Breaking up cocoa pods to extract the beans

*The correct spelling is CACAO tree, but the word cocoa, which is properly the fruit of the cacao tree, is used throughout for simplification.



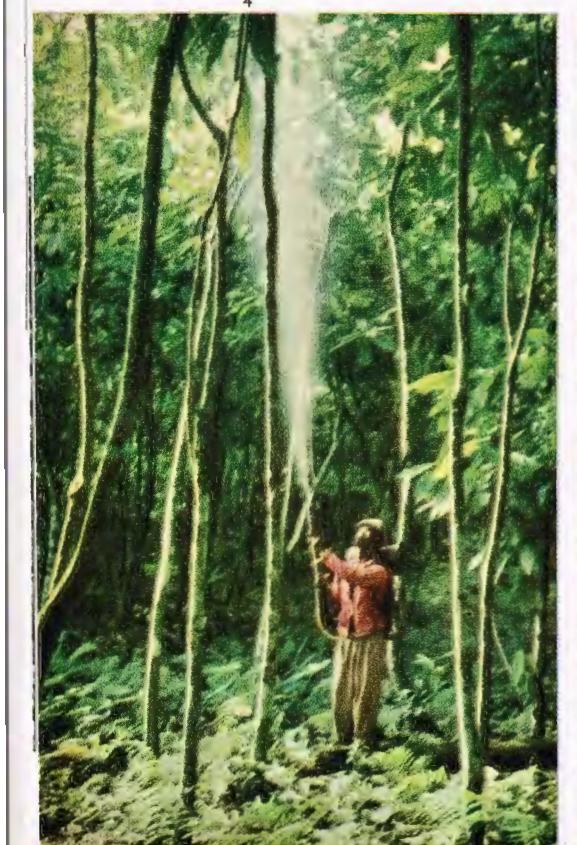
1. A nursery of cocoa seedlings grown in baskets. The seedlings are always kept in the shade and are planted out just a little more advanced than those shown here



2. Flowers are borne on the trunk and sometimes on older branches, but never on the young shoots that carry leaves. The tree is liable to flower at any time of the year and thus often carries both flowers and fruit pods at the same time



3. Mature cocoa trees bearing pods. The yellow pods are ripe. They will be picked by hand, and it is essential to cut off the pod without damaging the "cushion" behind it which will produce the next generation of fruit. Since the trees carry pods in several stages of development at one and the same time, the picking of fruit is selective and goes on throughout the year



4. Protective spraying of cocoa trees against capsid bugs. The spray generally used is ICP's 'Gammalin' 20, now manufactured in Tema, Ghana, by an ICI subsidiary. This spray has been most successful in controlling capsid damage, thereby leading to increased yields



5. Severe capsid bug damage. The bug feeds only on growing shoots, and the loss of these shoots in succession can kill a tree. The reddish-brown shoots in this picture are dead

6. A heap of pods just after picking. It is dangerous to leave the pods in heaps like this for long. They are carried in baskets—or on the larger farms in carts—to the fermentation centre



7. The traditional way of transporting pods from the plantation to the fermentation centre. Usually there are no roads through cocoa plantations, and this method of carrying is the only possible way of extracting the crop. Ghanaians carry exceptionally heavy loads on their heads



8. The fermentation centre. The pods are opened by being hit against a stone, and the beans inside are removed by hand



9. Turning beans during fermentation. After turning the beans, banana leaves are again wrapped over the heap to keep in moisture and promote fermentation. Every 48 hours for six days the heap is opened up and the beans are turned



10. A heap of beans during fermentation





Drying fermented beans on slatted platforms. The beans are turned by hand, and even exposure to the sun is important. Bad beans are removed at this stage

The cocoa tree is indigenous to the forests of the Upper Amazon, and was cultivated in Mexico by the Aztecs for many hundreds of years before the arrival in 1519 of the Spanish invader Cortez, who records that a drink made from cocoa beans was drunk at the Court of Montezuma. This drink was prepared from beans that had been dried in the sun, roasted in an earthen pot, and ground between flat stones; such spices as chilli and vanilla were added to the resultant paste, which was formed into cakes and dried. The cake was mixed with water and whisked to provide a chocolate drink which would not have appealed to our palates, for beans prepared in this way are bitter and contain about 50% of fats.

It is hardly surprising, therefore, that the Spaniards

were puzzled by the esteem in which the Aztecs held their ritual drink, but in the course of time they too developed a liking for it and began to cultivate the cocoa tree and introduced it to other colonies.

The cocoa story now moves to Europe. Chocolate as we know it only became possible after the discovery of sugar, and a book by Colmenero published in Madrid in 1631 gives a recipe in which sugar is added to cocoa, together with such flavourings as chilli, aniseed, vanilla, almonds and hazel nuts. By about 1660 this spiced drink had become fashionable in London and Amsterdam, but it was very different indeed from the cocoa or chocolate of today, since the technique of removing the fat from the cocoa bean—and at the same time softening its extreme



Dried beans being filled into sacks for shipping. Moisture content must be down to less than 8%

bitterness had yet to be discovered. This occurred in 1828, when the Dutch firm of Van Houten pioneered the fermentation process and the first fatless extract from the cocoa bean became the basis of cocoa as we know it today. In 1866 Cadbury Bros. followed suit with their "cocoa essence," and this was the foundation of the British chocolate industry.

Ghana's part in the cocoa story begins in 1880, when cocoa trees were first grown by small farmers. The crop fitted in well with farming practice and the climate was suitable. From this small beginning, cocoa production rose to such a pitch that by 1956 two-thirds of the world's cocoa was grown in West Africa, Ghana producing the lion's share. Behind this phenomenal success lay much hard work, first of all to establish the industry and then to maintain it, sometimes in the face of great tribulations. Today the Department of Agriculture in Ghana organises the farmers for cocoa production and carries out a heavy programme of education to this end. At Tafo it has the world's finest cocoa research station—the West African Cocoa Research Institute. Ghana's old name of the Gold

Coast referred to gold from the mines; gold is still being mined there, but Ghana's gold of today is truly the yellow pod picked from the cocoa tree.

Cocoa cultivation in Ghana has been subject to the depredations of two important pests. One, the mealy bug, has been responsible for the transmission of the virus causing swollen shoot disease, but the spread of this disease is now restricted by cutting out infected and adjacent trees.

The other important pest is the cocoa capsid, which can lead to—in fact has led to—a severe reduction in cocoa production. Field trials organised by the Department of Agriculture, supported by research work, pioneered mist spraying with gamma BHC. Plant Protection Ltd. played its part in this development by seconding experts for the field trials, by investigating and organising application methods, by helping to train spray operators, and by evolving a suitable formulation. Later, with the attainment of independence by Ghana, an ICI factory was established at Tema for the production of 'Gammalin' 20 for the control of cocoa capsid.

People and events . . .

Sir Alexander's Youth Awards

THE details of the Fleck Award—announced at Central Council last May—have now been worked out. Four awards are to be made each year worth £25, and the prizes are to consist of books or other suitable gifts rather than money.

This year's prizewinners are being selected from the Billingham, Dyestuffs, Metals and Nobel groups. Next year it will be the turn of Alkali, General Chemicals, Wilton, Head Office and the Regions, and so on.

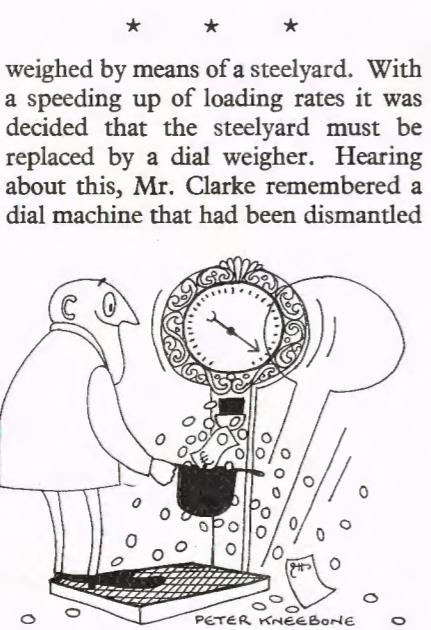
The prizes are open to boys and girls, staff and payroll. Candidates for the prizes, who must be under 21 and have been employed by the Company for a year on 1st October, can be nominated by managers or heads of departments or by at least 12 people employed in the group concerned. The final selection this year will be made by a committee under the chairmanship of the Division chairman or his nominee, and each committee is to include at least one representative of payroll employees and one of staff.

The prizes are to be awarded for all-round merit, with the main emphasis on performance on the job, general character and personality, and club, social and service activities at work and in the community.

£684 Jackpot

THE second largest award under the Suggestions Scheme ever made in Alkali Division has gone to **Mr. Horace Clarke**, until recently a weighing machine fitter and now an apprentice instructor at Alkali Division's Avenue Works. This is how it happened.

At one of Wallerscote Works weighbridges, bulk ash loaded from a conveyor into rail wagons used to be



from another part of the works, and he suggested that this one be used instead of ordering a new one.

When the dial was fitted, it became clear that with the steelyard overweight had been given. This was because the steelyard gives no indication that the correct weight is approaching until the required amount of ash is already in the wagon. Although the conveyor would then be stopped, it almost always meant that some overweight was given.

Enquiries showed that it would have taken 19 weeks to obtain a new dial if Mr. Clarke had not suggested using the secondhand one, and savings over this period were calculated to add up

to £1318. Mr. Clarke's share was £684—about half the amount saved. "It is certainly a windfall. I was delighted to receive it, and now I shall probably invest it," he said.

Close Questioning

THE American chemical industry is taking a close interest in affairs in Great Britain and Europe. **Mr. J. H. Townsend**, ICI sales controller, is just back from America, where the Chemical Market Research Association have devoted their 1960 conference to a study of the chemical industry in Europe and the opportunities which this gives to American firms. He spoke on the British chemical industry, outlining the increases in output since the war in the different sections of the industry, mentioning the many inventions to its credit, and expressing the industry's view that close integration in Europe is desirable.

Representatives from Italy, Germany and France also presented papers which set out the high rates of growth which their industries had achieved. He reports that his hosts were well informed about current developments in Britain and on the Continent, and he found he had to answer a lot of questions about such things as the European Free Trade Association and the European Economic Community. He was impressed too, by the notable American hospitality which he enjoyed.

Top Secretaries

A SHORTHAND-TYPIST in the Labour Department at Billingham, **Mrs. Audrey Ingram**, was among the last six candidates in the *News Chronicle's* Miss Secretary of Great Britain 1960 competition. The finals were held in

London at Grosvenor House on 29th September, and among the judges were Lord Baden-Powell, Miss Enid Chanelle of the dress shops fame, Mr. Geoffrey Johnson Smith, MP, and Mr. Mark Crehan, principal of Pitman's College.

The title eventually went to Miss Julia Hanson from Lancashire, who works for British Waterways. Her prize was a fortnight's holiday in New York with £100 spending money. Although she did not manage to win



Mrs. Ingram

Mrs. Smith

the title, Mrs. Ingram received as a consolation prize a Remington portable typewriter, as did **Mrs. Margaret Smith** of Dyestuffs Division's Huddersfield Works, who got as far as the last fifty.

What are the vital statistics for a top secretary? Mrs. Ingram has a shorthand speed of 160 words a minute and a typing speed of 90. In addition to reaching the last round of the Miss Secretary contest, she is one of forty finalists along with two other Billingham girls, **Mrs. Pat Betson** and **Mrs. Joan Rule**, in the National Typing Championships.

Mr. Inglis Retires

ONE of Central Council's most familiar faces will be missing at the

fiftieth meeting which takes place later this month at Blackpool. **Mr. Alfred Inglis**, its secretary for the past twenty-five years, will not be there. He retired from the Company at the end of September owing to continued ill health.

He has a record few can rival. He



Mr. Inglis

was present at the very first Works Council meeting back in 1929—he was then group labour manager of ICI (Metals)—and has missed only a few of the subsequent Central Council sessions. This perhaps explains the apparent ease with which he has conducted its affairs during his years as secretary and the great authority with which he was able to deal with its often complicated procedural problems.

Experience alone, however, is not his sole tribute. He is respected and admired by us all for his innate fairness, his imperturbability and his impish sense of humour, and he has set a standard for the job which it will be difficult for his successors to better.

* * *

His activities in the earlier days of the Company provide the clue to his later successes: his contribution to the formative years of ICI labour policy and its introduction at both factory and Division level—his leading role in the Metals Division annual boys' camps—his own sporting prowess (not least the Jessop-like centuries on the Kynoch cricket ground) and his association with Captain Claris in ICI—with sport and recreation activities—his concentration for a time on welfare schemes for the Company as a whole—the interregnum of the war years as manager of the Yeading factory.

He would normally have retired next June, and it is a great pity he has been prevented from seeing it through to the end, and incidentally from appearing on the platform at Blackpool on Friday fortnight. His many friends will wish him a speedy return to normal good health and a long and happy retirement.

Swiss House-hunt

THE day he retired from the Company **Mr. Godfrey Tate** flew off to Switzerland to embark on an intensive house-hunting campaign. He and his wife plan to settle there—probably in the Lausanne area—just as soon as they can find a house which suits them.

When he retired, Mr. Tate had completed nearly 32 years' service. Starting as a shift manager at Billingham, he transferred to ICI (New York) before

IN BRIEF

Praise from 'Which?' In the October issue of the Consumers Association publication *Which?*, 'Nyzip,' the nylon zip manufactured by Lightning Fasteners Ltd., was recommended as the best buy in the nylon retail range.

Firefighting—1. Diquat, the non-arsenical potato haulm killer which ICI sells under the trade name 'Reglone,' is currently being tested by ICIANZ to help fight Australia's big summer menace—bush fires. Diquat dries out green vegetation so that breaks can be burned before the summer danger period.

Firefighting—2. Seventy-four fire brigades from all parts of the Northwest competed in their own 'Olympiad' at Altringham held under the auspices of the Chester and District Fire Service. Castner-Kellner Works (General Chemicals Division) brigade won the Minimas Cup for hydrant drill and came fourth in the motor pump drill, and firemen Hulse and Wainwright came fifth in a field of 66 in the two-man hydrant drill with obstacles contest.

For Posterity. During the 1960 Homes Exhibition held at Melbourne, Australia, the Lieutenant-Governor, Sir Edmund Herring, buried a casket in the grounds of the exhibition building. Included among the contents was a copy of the special brochure prepared for the opening of ICI House, ICIANZ's skyscraper headquarters. The casket is to remain underground until September A.D. 2000.

'Terylene' and the Motor Trade. 'Terylene' is being used by Lockheed Hydraulic Brake Co. and Girling Ltd. as a reinforcement in all their hydraulic car brake hose. Lockheed and Girling between them make over 90% of all car brake assemblies in this country. They previously used cotton imported from the Middle East, but when the supply position became uncertain they decided to switch to 'Terylene,' on which trials had been progressing for some time with very promising results.

Polythene Tube. ICI and Yorkshire Imperial Metals are combining their activities in the marketing of polythene tube. YIM are marketing the combined product, which is to be known as 'Polyorc-Alkathene.' It is one of the very few polythene tubes licensed by the British Standards Institute to bear their kite mark.

Litter Drill. The plant cat on the gas plant of Gas and Power Works (Billingham) gave birth to a litter of kittens in a litter bin. Plant tidiness is the theme of the last of three safety campaigns organised on a Company-wide basis this year and which is now in progress.

PEOPLE

The Earl of Courtown, head of Office Administration Department, has been elected president of the Institute of Office Management. He has been a member of the Institute for 25 years and before the war was a member of the Council.

Dyestuffs Division's oldest pensioner, **Mr. Fred Fielding**, died recently at the age of 92. He joined Read, Holliday & Sons in 1889, and when he retired in 1933 he was a foreman at Dalton Works, Huddersfield. Until very recently he was a regular visitor to the foremen pensioners' functions at Huddersfield Works.

Mr. Alfred McIntosh, a process operator in Gas and Power works at Billingham, was one of five new Justices of the Peace sworn in at Stockton Borough Magistrates Court on 12th September.

Dr. J. M. Holm, a joint managing director of Nobel Division, has been appointed to succeed **Dr. James Craik** as chairman of that Division when Dr. Craik retires on 31st March 1961.

Two Alkali Division men were among Northwich anglers who competed in the All-England fishing match at Great Yarmouth on 24th September. **Mr. Bill Heardley** (a clerk on Construction Works) led the team of 12, which included **Mr. Jim Mayne** (a work study officer), who was last year's skipper and is chairman of the Northwich and District Joint Anglers.

Dr. C. L. Child, head of Plastics Division's T.S. and D. Information Services at Welwyn, has been nominated by the British Plastics Federation for inclusion in a panel of speakers for sound and

the war, subsequently returning to the American Department at Millbank of which he has been head for the last 15 years.

During the first world war he was a regular Sapper officer, and served in

France, where he won an M.C., and in North Russia. Then he went up to Cambridge to read mechanical sciences and followed this with several years in the Argentine and Paraguay before joining ICI.

Boom in Aerosols

SALES of push-button aerosol are going up by leaps and bounds. Production of these aerosols introduced to the British public about ten years ago, stood at just over 5 million in 1955, reached



Mr. Tate

Since the last war he has covered many thousands of miles on ICI business. In one fantastic year during the height of the disengagement negotia-

television being assembled by the British Employers' Federation and the Federation of British Industries. Dr. Child's television debut was in the Science Survey series. He has broadcast in Woman's Hour and appeared in a number of children's educational programmes.

Mr. Alfred Longstaffe, a processman on Ammonia Works at Billingham and a former pipe major of the Argyll and Sutherland Highlanders, hopes to interest enough boys and girls in the factory in playing the pipes to be able to form a pipe band. As bait he offers free tuition.

Mr. P. J. Torrie (Central Work Study Dept.) resigned from the Company at the end of September to take up his new appointment as head of the King Edward VII Hospital Fund work study project. This appointment was the direct result of a request made by the Minister of Health for help in the training of work study staff for the hospital service.

A 17-year-old apprentice fitter, **Charles O'Neill** (General Chemicals Division), clocked the fifth fastest time out of 66 starters in the Worcestershire Cycling Association's 25-mile road race. He has also been nominated junior best all-rounder of the year by Oldbury and District Cycling Club.

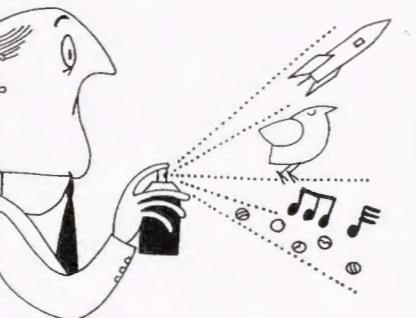
Three members of the Nobel Research Department, **John McAllister**, **Janet Smith** and **Robert Young**, were for four weeks the reigning champions of ATV's quiz programme "Pencil and Paper." They defeated a team of schoolteachers, a team of secretaries, a team of journalists and a team of international chess players before retiring undefeated.

tions with Du Pont arising from the U.S. Anti-Trust action he made six trips to the United States in as many months and also spent nearly three months in Latin America. More recently he has been actively concerned in the Company's investment programme in the Argentine, including the £5½ million polythene project announced last July.

His personal popularity extends well beyond ICI circles, and he has a host of friends in the United States, Canada, and many parts of Latin America.

25 million last year, looks like topping 40 millions by the end of this year and may reach 100 million by 1963.

Today it's almost a question of what can't you get in aerosols. From the tiny cans and plastic-coated bottles used for expensive perfumes to the large 20 oz. packs used for veterinary sprays, the products and packages are legion. Insecticides, air-fresheners, hair lacquers, shampoos, shaving creams, paints, polishes and pharmaceuticals are but a few of the products



now available. The whole idea of aerosol packaging stems directly from the insecticidal "bomb" developed during World War II for use by troops on active service in the tropics.

All this means brisker business to General Chemicals Division, who produce, at Rocksavage Works, Runcorn, 'Arcton' chlorofluorohydrocarbon propellents which are a vital ingredient in aerosol packaging.

Day and Night Service

THE following story recently appeared in the correspondence columns of the *Evening News*. Someone cut it out and sent it to **Mr. Lewis Inglis** of Central Staff Department. He liked it and thought the *Magazine* might too.

The letter relates how in the early hours of the morning the writer was driving along Millbank with some American relatives and stopped to show them the doors of Imperial Chemical House. By mistake the door-bell was pushed. "We made a hasty retreat to the car, but when the night watchman (**Mr. Fred Coomber**) suddenly appeared we thought it proper to explain and apologise. However, he was not angry, as he might well have been, but

insisted on opening and telling the story of the doors and presented Mrs. Handley (one of the Americans) with a booklet to take back to the U.S.A. What a wonderful advert for our tourist industry."

Fabulous

FOUR members of the gymnastic section at Billingham gave a five-minute agility display in the Frankie Vaughan Show held at the Royal Festival Hall last month in aid of the National Association of Boys' Clubs.

They were **Peter Barker**, a 19-year-old apprentice, who is joint holder of the Amateur Gymnastics Association's national vaulting and agility championship, **Lloyd Readhead**, another apprentice, who was third in the AGA championships, **Keith Coppick**, a joiner, and 17-year-old **Geoff Ferguson**, another apprentice.

The show is presented at the Festival Hall each year as part of the NABC's national boys' clubs week, with half the acts by professional entertainers and the remainder by boys from clubs throughout the country. This year the professionals included Harry Secombe and David Nixon.

The Billingham team were chosen at an "audition" before Mr. R. Elliott, an NABC physical education specialist who helps to organise the show. He commented afterwards: "They are very good—in fact they're fabulous!"

Later this month the three apprentices have another big date. They will be competing in the AGA's men's British vaulting and agility championships, which are being held this year in the Billingham Synthonia Club gymnasium.

Witch-doctors

PIONEERING anywhere has its humorous moments. Two are mentioned by **Mr. W. V. Blewett**, one of the pioneers of what is now African Explosives and Chemical Industries, an ICI associate company, in the company's magazine *Outlook*.

He was one of a small group of works chemists at Umbogintwini, near Durban, now the largest fertilizer factory in Africa and then an explosives plant which at that time—the early

1900s—employed about a thousand native workers. To the African the chemist working in his laboratory meant someone who dispensed medicines and pills, and it was not long before they were calling the chemists "tagati"—witch-doctor—and asking for medicine for their aches and pains.

"They brought us snakes so that we could make medicine from their



Assistant Chief Labour Officer; Mr. R. L. Stanton, Chief Catering Adviser. **ICI (Malaya)**: Mr. G. E. M. Jones, Chairman. **Metal's Division**: Mr. J. M. Mitchell (President of Alcoa International) and Mr. M. J. S. Ciapham (Division Chairman), directors of Almin Ltd.; Mr. W. Brining, Mr. J. M. Graham (directors of Almin Ltd.), Mr. J. M. Mitchell and Mr. S. W. Weyson (ICI Deputy Treasurer), directors of Impalco. **Scottish Agricultural Industries**: Mr. R. Alexander, Secretary.

RETIREMENTS

Some recent announcements of senior staff retirements are: **Billingham Division**: Dr. J. Manning, Division Products Technical Manager (retiring 30th November). **Head Office**: Mr. A. W. Inglis, an Assistant Chief Labour Officer (retired 30th September); Mr. W. J. Willmott, Chief Catering Adviser (retiring 30th November). **ICI (Malaya)**: Mr. J. B. Wood, Chairman (retiring 31st March 1961). **Scottish Agricultural Industries**: Mr. W. J. Ramsay, Secretary (retired 30th September).

50 YEARS' SERVICE

The following employees have completed 50 years' service with the Company: **Alkali Division**: Mr. E. Askey, Buxton Lime Works (15th October). **General Chemicals Division**: Mr. H. Cartledge, Castner-Kellner Works (13th October). Mr. T. Howard, Pilkington-Sullivan Works (30th September).

OBITUARY

Mr. Cyril Morris

Cyril Morris's many friends throughout ICI will be grieved to learn of his sudden death on 3rd September at the age of 63. He had served at Landore Works for 48 years as a patternmaker and had been chairman of the workers' representatives at both Division and Central Councils, and a member of the board of management of the Friendly Society. His obvious sincerity and strength of purpose served him well on these occasions, and when Yorkshire Imperial Metals was formed he continued to take a keen interest in joint consultative matters—in fact he represented Landore at the first YIM Central Council, held at Ilkley last April.

His activities outside ICI were many and varied. He was chairman of the South Wales and South-west England district committee of the United Patternmakers' Association, and it was while attending a meeting of this committee at Bristol that he was taken fatally ill. Social welfare was a cause close to his heart, and, as chairman of the Friends of Mount Pleasant Hospital, Swansea, he performed much valuable work in the town. He also served on the Industrial Savings Advisory Committee for South Wales and, a prominent lay member of the Swansea and Brecon diocesan conference, he was a churchwarden of St. Jude's, Swansea.

After a life of service to the community, Cyril Morris died in harness, which is what he would have wished. Old colleagues in ICI and YIM have lost a valued friend. Our deepest sympathy is extended to Mrs. Morris and her two sons.

Man with a Load of Salt

Interviewed by Denzil Batchelor

JACK Warburton, unlike ninety-nine out of a hundred men met on a day's march, is happy: because he has a job he loves in an industry which is of absorbing interest to him. He is a bulk delivery air-discharge vehicle driver at Winsford, which means that he drives an ADV (Air Discharge Vehicle), one of Salt Division's fleet of Leylands, perhaps the 10-ton eight-wheel Octopus carrying the twin aluminium "pots," each containing 7 tons of salt, to be delivered to customers' silos and saturators all over Britain.

He loads the salt from the Winsford silo himself—this part of the job takes an hour—washes down his vehicle and drives off (alone on all but the most arduous trips) to take salt to Galashiels—400 miles by road—or Penrhyn-deudraeth in Snowdonia; to Grimsby, Hull or London. After a driving job lasting 11 hours he has nine hours off; after two 11-hour jobs he has a spell of 12 hours.

A normal working week is five days. In bad weather the job will take six. "Snow, storm or fog, the customer has got to have his salt," he says quietly, "otherwise he'll do one of two things. He'll have to shut down his works, or go elsewhere." He doesn't mind frost, but snow can make his world a white hell.

The beginning of his job—the loading—is the easiest part. He drives his vehicle under the 1000-ton silo at Winsford, connects it with a nylon sleeve, and within an hour both the huge "pots," looking like vast salt-sifters in a cruet, are full. Next he washes his Octopus. Then he sets off, perhaps on his shortest trip, the four miles to a local bacon factory; or perhaps on a run that takes more than eleven hours, which means that the vehicle carries a second driver. On arrival Warburton connects the air-discharge apparatus with a flexible hose, puts it into gear, and shoots the salt up into the customer's silo.

* * *

There are two reasons why he finds this job the best he has had in his life. "First of all," he explains, "I spent seventeen years on the manufacturing side in the salt industry—and I never had the faintest idea where the stuff went to. Now I've got the chance of seeing the other side of the business." He has learned much of the world's

need for salt: vast quantities are used in industry and a large national demand (not supplied by the ADVs) is for stocks used on the roads in frosty weather. Then there is the heavy demand from the baking trade: there is 2% in bread. There is the salt needed by livestock: animals eat nearly as much salt in Britain as human beings. And there is salt for the water-softeners at great industrial plants. He has learned that ICI exports salt to New Zealand, and to Nigeria, which used to get its supplies for the stock-pot by camel-train from the Sahara salt-pans.

The second great point about Warburton's job is its variety. "I'm seeing different towns taking new shapes every day," he explains, "and I'm meeting different people, different types, on every trip. When I was a pansmith I saw the same faces every day of my life." For Jack Warburton was, as you might say, born and bred in salt. His father still works in the Meadowbank rock salt mine in Winsford, the only one in the country. He himself began as a rivet boy of 14 heating rivets from 8 a.m. till 5 p.m. (on Saturdays till noon), and earning eleven and fourpence a week.

He was a pansmith at 23—the youngest ever to hold the job—repairing salt pans 75 ft. long by 31 ft. 6 in. wide and 22 in. deep. When the centuries-old manual jobs gave place to the present mechanised system it was as if a little backwater of the Middle Ages had been superseded in a flash by the Industrial Age itself.

* * *

Jack Warburton took his present job after learning to drive in the Military Police during the war—he still holds a "body receipt" for a civilian smuggler, disguised as a soldier, whom he arrested and handed over to Scotland Yard. He has never had an accident and never got bogged down in a snowdrift. He is a teetotaller, and wishes all other drivers were.

He has no complaints to make against women drivers, and considers that, despite the amount of traffic on the roads, the standard of driving generally has not deteriorated since the war. Perhaps his worst natural enemy is the cyclist; and Hull is the city where there seem to be more cyclists than pedestrians.



Jack Warburton

PLANNING WITH A ZIP

By a special correspondent

The planning of a smooth production schedule for ICI's 'Lightning' fastener factories—among the world's largest zip manufacturers—has long been something of a headache. No fewer than 40,000 separate items of stock are involved, and demand for each fluctuates with fashion. Today's answer is to feed the statistics into LEO, a computer hired for only four hours a week. A fully integrated system of stock control and production planning is the result.

LIKE most people, you probably drop in from time to time at your nearest draper's to buy a zip fastener, and you will be quite disgruntled if you cannot get exactly the style, length and colour you want. The wholesale garment and leather goods manufacturers, who use zips by the hundred or thousand, feel the same way. So to satisfy all customers someone has to work out just what types of fastener will be wanted. And where. And when.

How does a firm like Lightning Fasteners Ltd., one of the world's largest zip manufacturers, cope with this problem? Clearly it is one which must be solved, both to keep faith with their customers and to avoid piling up unwanted stocks.

Too Heavy a Task

A wealth of past experience and thousands of man-hours have been devoted to forecasting and planning the demand for 'Lightning' fasteners, taking into account such important factors as changing fashions, seasonal fluctuations and local habits. The main difficulty has always been the sheer volume of clerical effort involved.

Remember that 'Lightning' fasteners are made in thousands of style/length/colour combinations and, for the home market, are sold either direct to manufacturers or through eight sales depots to a vast number of retail shops. Altogether, nearly 40,000 separate items of stock

are involved in this country alone, and sound forecasting can only begin when up-to-date information is available on all of them. The task of collating and cross-checking these statistics, and of doing so quickly enough to be really useful, has become more formidable with every rise in output.

Now, mercifully, a more-than-human calculator has "come to the aid of the party." This is LEO, the property of a firm which is closely connected with a famous catering organisation, and LEO works for L.F. for only four hours each week. That is time enough for this electronic genius to assimilate the records of all home sales during the past week, which are fed to it in the form of punched cards, to offset these against stocks at the different sales points, and to bring up to date the year's sales history of each type of fastener in each area.

Even this is no more than a limbering-up exercise. Without overrunning its very short working week LEO, from its own records, estimates the likely rate of future sales from each stockpoint and converts its mass of pure statistics into "instructions."

Statistics into Instructions

The printed or punched cards which it finally produces explain which stock items need replenishing, and by what amount; to what extent stock replenishments at each sales point can be met from the central warehouse or by



LEO computer operators at work

simple transfers; and how new production should be slanted to cater for foreseeable demand. The "instructions" also show information about the average rate of sales, the last month's sales and the present stock of each individual type of fastener. LEO produces a further statement showing exactly which types of fastener should be made, and gives information on the machine hours, work units, raw materials and packages required to manufacture the fasteners concerned.

The computer plans a full-capacity production programme each week. The only thing it cannot forecast is orders for "specials"—that is, fasteners of a type or size outside the standard range. Requests for "specials" usually come from very important customers to meet a specified need, and they always have first priority, taking precedence over all other commitments, and they may well be manufactured between one computer run and the next. What happens then is that as many as possible of

the standard items "ordered" by the computer are completed from the remaining capacity available; any outstanding numbers are taken into account in the next week's calculations.

LEO has been on this job for only a few months, but already plans are afoot for extending the scope of its work. The first stage will be to simplify operations by eliminating most of the punched card work now needed before and after the computer operations. The next stage will probably be to include export transactions in the system, and to augment still further the computer's power of answering questions and of tabulating information in precisely the form required.

A number of ICI departments have co-operated in gearing the machine to provide the information required, and we understand that it is the first time in this country that a computer has been used to supply a fully integrated system of stock control and production planning.

ICI's RECORD HALF YEAR

On 23rd September last, ICI profit-sharers heard the good news that their shares had hit a new peak of 74s. This followed the announcement of a record half-year for ICI's sales and profits and of the raising of the interim dividend. The news made headlines in the Press. Here are some of the comments.

UNDER the heading "Lower Prices but ICI's Profits Soar" the *News Chronicle* wrote: Record sales, a 40% jump in net earnings and a better than expected interim payment announced by Imperial Chemical Industries, Britain's largest industrial group, should cheer stock markets today. ICI's own shares were rushed up 4s. 4½d. to 74s. 1½d., a new peak, in after-hour dealings. The interim dividend is being stepped up from 3½ to 6¼%. This was well above best market expectations, though an upward adjustment to bring the two payments more into line had been forecast . . . These are splendid figures reflecting the high level of industrial activity last year and in the early part of this year. They are even more impressive allowing for the fact that home selling prices of ICI's main products were 2% lower than in the first half of last year.

Under the heading "Boom Time for ICI. Profits Up! Dividend Up! Shares Up!" the *Daily Express* wrote: You can be sure that ICI's 90,000 workers will not object to this prosperity. For under a profit-sharing scheme they collect shares in the group. So what is good for the shareholders is good for the workers too. But the big lift in profits margins is explained by the high turnover of ICI plants which were running nearly flat out. For in the giant plants, like ICI operate, it is the last little extra in a big turnover that pulls in the biggest profit cream. Mr. Chambers also did well in the export market, with overseas selling leaping £6,000,000 to £47,300,000.

GROUP PROFIT AND LOSS ACCOUNT OF IMPERIAL CHEMICAL INDUSTRIES LTD AND ITS SUBSIDIARIES AT HOME AND OVERSEAS FOR THE HALF YEAR ENDED 30th JUNE, 1960		FIRST HALF 1959	FIRST HALF 1960
GROUP SALES TO CUSTOMERS AT HOME AND ABROAD...		£250,000,000	£288,000,000
GROUP INCOME BEFORE TAXATION after charging Depreciation...		£33,966,000	£50,935,000
Less: TAXATION		£15,593,000	£17,853,000
GROUP INCOME AFTER TAXATION		£13,943,000	£23,335,000
Less: Applicable to Minority Members of Subsidiaries		£20,023,000	£27,600,000
GROUP INCOME AFTER TAXATION APPLICABLE TO IMPERIAL CHEMICAL INDUSTRIES LIMITED		£1,261,000	£1,552,000
		£18,762,000	£26,048,000

Under the heading "ICI's Excellent Half Year" the *Financial Times* wrote: The increase in sales is a particularly good one, beating both the index of industrial production and the average for the chemical industry as a whole. Under the heading "Fabulous Chemical Profit—ICI's £50 million for Six Months" the *Daily Herald* wrote: A truly remarkable half-year's trading is reported by Imperial Chemical Industries! Profits for the first six months of 1960 have soared to £50,900,000, before tax. That is £17 million more than in the same months of last year. These results are even more remarkable when it is recalled that prices of ICI's main products in the home market were down 2%. It is all great and glorious news for shareholders.

November IN THE GARDEN

STANDARD ROSES

By PERCY THROWER

HERE will be more roses sold during the autumn and winter than any other individual plant or tree. This has been so for some years now, and that in itself shows the ever-increasing popularity of the rose.

There are few things we buy which can compare with the rose so far as value for money is concerned. A rose bush costing from 4s. to 5s. will last, if properly looked after, for ten, fifteen or more years, and every year it will flower without fail from early June to November. Everyone who likes roses advises growing standard roses between the bush roses.

Being more difficult to grow, the standard roses are much more expensive, costing in the region of 15s. each. Generally speaking, they are not so long lived as the bush rose. They are budded at the top of briar stems 3½-4 ft. high and need more care and attention than the bush roses. Most of our favourite varieties of hybrid tea roses can be had in standard or half-standard form, also some of the floribunda roses and rambler roses which form a weeping standard.

I think I prefer a weeping standard to any other form. The arching branches covered in red, pink or yellow are so graceful. To

get the full effect of a weeping standard it needs to be planted as a specimen by itself. These are usually budded on to briar stems 5-6 ft. high.

The most important thing when planting standard roses of all kinds is to provide a strong support, otherwise the weight of the head and the wind will snap the slender briar stem. Wooden stakes 1½ in. × 1½ in. and 7 ft. long will be needed for a weeping standard; or 1 in. × 1 in. and 5 ft. long for other standards.

The hole for planting must be large enough to spread out all the roots and sufficiently deep so that the rose is planted the same depth as when in the nursery. By looking at the stem the soil mark will be clearly seen, and this is our guide. The stake must be driven into the bottom of the hole before putting in the rose, otherwise if done after planting many of the roots may be broken.

Place the stem of the standard against the stake and loosely tie it to support it while doing the planting. Work some fine soil between the roots, and as the hole is filled in, firm the soil by treading it with the feet. The stem must then be securely fastened to the stake, and for this I prefer to use strong tarred twine; it will need three ties to give

it a good support, one at the top just below the head, one in the middle, and one about a foot above the soil level. To prevent chafing the bark of the stem put sacking or a piece of old rubber tyre round first, then the twine twice round the stem and stake together, and once more round the stake before tying.

Standard hybrid tea and floribunda roses need pruning in the same way as the bush forms, except of course that pruning is done at 4-5 ft. from the ground. If the point of budding on to the briar where the standard rose is branching out is taken as soil level the pruning is the same; this is done in late March. Weeping standards, being rambler roses, need different pruning; these should be pruned as soon as flowering is finished in late August or early September. The flowering branches are cut back to within 2-3 in. of the main stem and the current year's growth left on; on this we get the following year's flowers.

Almost any good garden soil will grow roses well if it is enriched with manure, compost or peat, and to this can be added bone meal and a little ground limestone if the soil has a tendency to be sour. Dig the soil deeply and enrich the soil, and your roses will repay you over and over again.

Soccer's Ladder of Success

By Denzil Batchelor

The rise to fame of a footballer can be spectacular to the public. But to the individual it is a steady slog up the ladder. Denzil Batchelor here explains just what that ladder is and reveals that Wolves alone have 120 contact men with their eye on the lower rungs.

HE might be your son . . . the twelve-year-old boy who traps a ball better than his neighbour, swerves down the wing outside the full back, and then shoots hard and straight. Even at this age he has—he can have—his foot on the bottom rung of the ladder of fame: if you (and he) are serious about his football. He is, already, old enough to be noted, and encouraged to take the first of many steps that can lead to the top.

The great powers behind organised football are there to help now he is twelve. What are these great powers? Well, they are many, among them the English Schools Football Association; the Football Association itself; and the Central Council of Physical Recreation.

If at 12 our young prodigy is good enough to represent his age-group at school, he may be picked to play in competition for trophies offered by County Associations for boys between his age and sixteen. Between fourteen and sixteen the keen boy will benefit from the F.A. Coaching Scheme, if, like thousands of other schools, his own applies through its County Association for three visits from a trained F.A. coach in the Christmas term. If he's at a grammar school or public school, he has a chance of summer holiday courses and matches in the Christmas holidays, perhaps with the great Jimmy Hill of Fulham as instructor.

Already he is on the way up. Now, if he is under fifteen at the beginning of the season, he has his first great chance: he can represent his district in the competition for the English Schools Trophy, won last year by Manchester from a field of 346 districts covering some 12,000 schools.

Ahead lie schools internationals and youth internationals, in the latter of which Johnny Haynes, Jimmy Greaves, Ray Parry, Duncan Edwards and Bobby Charlton all first won renown. Then at seventeen comes the opportunity to sign on as a professional footballer. And this is where—if you are a parent—you must be wary: very wary. Professional clubs are forbidden to exert pressure or improper influence on boy or parent: but I fear that some do. A good job, or a soft job for the father may be the deciding factor when the youth comes to make his choice of club.

One way of stopping poaching is the new probationary scheme whereby a boy can sign with a club at 15 and leave with his amateur status unimpaired at 18, if he so decides.

Let us suppose the 17-year-old and his family have noticed that certain clubs encourage youth and stick to their chosen players through thick and thin to the end of the story. Wolverhampton Wanderers, for instance . . . This club, winner of last year's Cup



Wolves in action. Ron Flowers, No. 6 in dark shorts, and Peter Broadbent, No. 10, were both with Wolves as juniors

and twice champions of the League in the past three seasons, are proof incarnate of the success of the ladder system in the top class of football. The Wolves have 32 professional players on their books this season. Twenty-nine of them—including Bill Slater, captain of the Cup team—joined the club as amateurs. Twenty-three of the thirty-two first played as teenagers with Wolverhampton juniors.

Eight of last season's Cup winning team began with the club as juniors. George Showell, right back, joined Wolves from school: his partner, Gerry Harris, and Ron Flowers, left half, have gone up the ladder from the juniors to England Under-23 caps; and Flowers has also won full international honours; Edwin Clamp, right half, was a schools international and since has won 4

full caps for England. Gerrard Mannion was a Youth international: Norman Deeley was a schoolboy cap. Tall, angular Jimmy Murray, who joined Wolves as a ground staff boy, has since played for the England Under-23 team. Barry Stobart is the eighth man who joined as a junior to get a Cup winner's medal last year.

It's a fantastic record: yet *inevitable*. The plain fact is, it's the logical climax of the Wolves' policy of team-building, begun by Major Buckley when he became the club's Manager in 1927.

"I've done nothing but follow Major Buckley's plan," Wolves' manager, Stan Cullis, said to me. The plan was to collect footballers as juniors, and train and develop them into first-class players—and, above all as *members of a team*.

Stan Cullis is a living example of the plan in action. He himself was born in Ellesmere Port, but his parents were Wolverhampton



Stan Cullis, the Wolves manager, explains a point of strategy to Peter Broadbent and the author



Norman Deeley saga.

ABOVE: Aged 18. RIGHT: Scoring the third and final goal against Blackburn Rovers in the 1960 Cup Final. BELOW: A characteristic Deeley dash

folk and his father always said there was only one club for Stan, if he was good enough. So Cullis played his amateur football at school, and at seventeen reported for a trial at the Molineux Ground—and went into the Wolverhampton team. At nineteen he was captain. At twenty-two he was captain of England, and the greatest centre-half since the change in the off-side law. Now he is manager.

Today he has some 120 contact men all over the country, looking for boys of promise. For three weeks before the season begins boys between school-leaving age and eighteen play three matches a week at Molineux. Their form is noted: and sometimes they make themselves a career, there and then: Ron Flowers, Barry Stobart and Roy Swinbourne first came to notice in this way.

At seventeen the newly admitted professional earns £10 a week—which may be doubled if at that tender age, like Cullis himself, he happens to be good enough for a place in the first team. At eighteen his wages go up to £12 10s.: at nineteen to £15: and in the first team he earns £20 a week, with bonuses for wins and drawn games. He may hope to stay in football till he is 35: and when he retires he draws eight per cent of his total salary free of income tax, set aside as provision for a very young “old age.”

Sometimes it is suggested that there is no possible



future after retirement. If so, that is the footballer's own fault. There is every facility for the youngster to learn a trade at night school or Technical College. “But mind you,” Cullis remarked to me, “he mustn't forget to learn his own trade first—and that's football. When I joined Wolves at seventeen, I went to night school for five years—until the outbreak of war. There wasn't time to take a day off a week to go to Technical College.”

Several members of the present side have other jobs: Bill Slater, the captain, is a lecturer at Birmingham University; Peter Broadbent runs a grocery business; Edwin Clamp and Malcolm Finlayson both have part-time jobs. “That's one advantage about

playing for a club like Wolverhampton,” Cullis pointed out. “There is every chance of making local contacts and forming business attachments before your playing career comes to an end.”

And when it does . . . it is still possible that you may reach the topmost rung of the ladder by becoming manager of a club, like Cullis himself. While I was talking to him, young Headley, the Worcestershire cricketer, called to collect a bat he had left to be autographed by the Wolves' team. “Have you signed it?” he asked Cullis.

“Yes—at the bottom.”

“You should have signed at the top,” said Headley. He had something there.



Victory at Wembley last May. Bill Slater (captain) holds the trophy. Norman Deeley, who scored two of the three goals, is on the extreme right



Fishing Fleet, Lake Victoria, Kenya

Photo by C. W. Ball (General Chemicals Division)